

Applicant : Zhimin Liu
Serial No. : 10/690,735
Filed : October 21, 2003
Page : 11 of 17

Attorney's Docket No.: 13854-021002

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

- 1-4. (Cancelled).
5. (Currently Amended) A tap output collimator, comprising:
a GRIN lens having a first side including a first planar incline surface and a second planar incline surface for receiving an input light beam for separating and projecting said the input light beam into a downward projecting beam with a small downward projecting angle and an upward projecting beam with an upward projecting angle and for focusing said the upward and downward projecting beams into an output optical fiber and a tap output optical fiber respectively.
6. (Currently Amended) The tap output collimator of claim 5, further comprising:
a dual fiber capillary disposed positioned at an output end of said the GRIN lens for containing holding and disposing-positioning said the output optical fiber and said the tap out output optical fiber on a focal point of said the GRIN lens.
7. (Currently Amended) The tap output collimator of claim 5, wherein:
—— said the first planar incline surface and the second planar incline surface having have a surface area ratio corresponding to a tap output ratio for projecting a portion of said the input light beam to said the tap output optical fiber according to said the tap output ratio.

Applicant : Zhimin Liu
Serial No. : 10/690,735
Filed : October 21, 2003
Page : 12 of 17

Attorney's Docket No.: 13854-021002

8. (Currently Amended) The tap output collimator of claim 5, further comprising:
an optical signal detector for measuring ~~said the~~ downward projecting light beam
projected to ~~said the~~ tap output optical fiber.

9-10. (Cancelled)

11. (Currently Amended) A multiple beam collimator, comprising:
a GRIN lens for collimating ~~multiple~~ input light from ~~multiple~~ a plurality of optical
fibers;

a glass prism having ~~multiple incline surfaces and at least one normal surface, said~~
~~incline surfaces are for bending said multiple beams collimated from off-axis fibers to be parallel~~
~~each other and parallel to central axis of the collimator and the normal surface transmit the beam~~
~~collimated from on-axis fiber without bending, a first side including at least one surface normal to~~
a central axis of a collimator and a second side including a plurality of incline surfaces, the glass
prism operable to receive, at the first side, one or more upward and downward collimated light
beams from the GRIN lens and transmit light beams, refracted parallel to the central axis, from
the plurality of incline surfaces of the second side.

12. (Currently Amended) The multiple beam collimator of claim 11, further comprising:
a multiple fiber capillary disposed at an input end of ~~said the~~ GRIN lens for ~~containing~~
holding and disposing positioning multiple one or more optical fibers.

Applicant : Zhimin Liu
Serial No. : 10/690,735
Filed : October 21, 2003
Page : 13 of 17

Attorney's Docket No.: 13854-021002

13. (Currently Amended) A tap output collimator, comprising:
a GRIN lens for receiving an input beam with a small incident angle relative to an optical axis of the said GRIN lens;
a lens holder for holding the said GRIN lens having a front portion extended beyond a front surface of the said GRIN lens for holding a reflecting mirror at a distance away from the said front surface of the said GRIN lens;
the said reflective mirror is disposed at a small incline angle relative to a perpendicular line to the said optical axis of the said GRIN lens; and
the said GRIN lens further having a partially reflecting front surface for transmitting an output beam through and reflecting a portion of the said input beam to the said reflective mirror for reflecting the said portion of the said input beam into the said GRIN lens with a tap output optical path separated from the said incoming beam.
14. (Currently Amended) The tap output collimator of claim 13, further comprising:
a dual fiber capillary disposed at an output end of said the GRIN lens for containing and disposing a set of dual optical fibers at said the output end of said the GRIN lens for receiving said the output beam and said the tap output beam from said the GRIN lens.
15. (Currently Amended) The tap output collimator of claim 13, wherein:
——said the partially reflecting front surface of said the GRIN lens having a transmission/reflection ratio of transmission to reflection corresponding to a tap output ratio for projecting a portion of said the input beam to a tap output optical fiber according to said the tap output ratio.
- 16 (Currently Amended) The tap output collimator of claim 13, further comprising:
an optical signal detector for measuring said the tap output beam projected to a tap output optical fiber.
- 17-20. (Cancelled)